

AMENDMENTS TO THE CLAIMS

1. (CURRENTLY AMENDED) A synthesis method for synthesizing a $\text{Si/C/N/E}_a/\text{F}_b/\text{G}_c/\text{O}$ multielement nanopowder directly suitable for sintering, where E, F, and G represent three distinct metallic elements other than Si, and at least one of a, b, and c is non-zero, the method ~~being~~ characterized in that it comprises the following steps:

- using an aerosol generator to generate an aerosol comprising at least one metal precursor containing at least one of said metallic elements, and hexamethyldisilazane $\text{Si}_2\text{C}_6\text{NH}_{19}$, used as a main source of Si and as the sole solvent for said at least one metal precursor;

- adding to said aerosol silane SiH_4 or its equivalent in gaseous form so as to form a reaction mixture; and

- proceeding with laser pyrolysis of said reaction mixture.

2. (CURRENTLY AMENDED) A synthesis method according to claim 1, ~~characterized in that~~ wherein said metallic elements are selected from Al, Y, Mg, Yb, and La.

3. (CURRENTLY AMENDED) A synthesis method according to claim 1 ~~or claim 2, characterized in that,~~ wherein at least one metal precursor comprises yttrium isopropoxide $\text{C}_9\text{H}_{21}\text{O}_3\text{Y}$.

4. (CURRENTLY AMENDED) A synthesis method according to ~~any one of claims 1 to 3, characterized in that~~ claim 1,

| wherein at least one metal precursor comprises aluminum
secbutoxide $C_{12}H_{21}O_3Al$.

5. (CURRENTLY AMENDED) A synthesis method according to
| ~~any one of claims 1 to 4, characterized in that~~ claim 1,
| wherein at least one metal precursor comprises aluminum
isopropoxide $C_9H_{21}O_3Al$.

6. (CURRENTLY AMENDED) A synthesis method according to
| ~~any one of claims 1 to 5, characterized in that~~ claim 1,
| wherein ammonia NH_3 or its equivalent, in gaseous form, is
also added to said aerosol.

7. (CURRENTLY AMENDED) A method of fabricating a
| composite ceramic, ~~characterized in that~~ wherein a
Si/C/N/ E_a / F_b / G_c /O multielement nanopowder directly suitable
for sintering is synthesized using the synthesis method
| according to ~~any one of claims 1 to 6~~ claim 1; and said
nanopowder is sintered directly.

8. (ORIGINAL) A Si/C/N/ E_a / F_b / G_c /O multielement nanopowder
in which E, F, and G represent three distinct metallic
elements, other than Si, and at least one of a, b, and c is
non-zero, characterized in that it is directly suitable for
sintering without needing to be subjected to a prior mixing
or annealing step, in that each nanopowder grain contains
all of the elements Si, C, N, E_a , F_b , G_c , and O, and in that
it presents a chemical composition expressed in terms of

equivalent stoichiometric compounds, as determined by calculation from element analysis, such that the free carbon content is less than 2% by weight and the SiO_2 content is less than 10% by weight.

9. (ORIGINAL) A nanopowder according to claim 8, characterized in that the metallic elements E, F, and G are selected from Al, Y, Mg, Yb, and La.

10. (ORIGINAL) A nanopowder according to claim 9, characterized in that the metallic elements E and F are respectively aluminum Al and yttrium Y.

11. (CURRENTLY AMENDED) A nanopowder according to ~~any one of claims 8 to 10~~ claim 8, characterized in that the index c of G_c is zero, such that the nanopowder contains only the two metallic elements E and F.

12. (CURRENTLY AMENDED) A nanopowder according to claim 16, ~~wherein 10 or claim 11, characterized in that the~~ chemical composition expressed in terms of equivalent stoichiometric compounds, determined by calculation from element analysis, is such that the sum of the contents of Al_2O_3 and Y_2O_3 is greater than 3%.

13. (CURRENTLY AMENDED) The use of a $\text{Si/C/N/E}_a/\text{F}_b/\text{G}_c/\text{O}$ multielement nanopowder according to claim 8 ~~any one to claims 8 to 12~~ for fabricating a composite ceramic.

14. (CURRENTLY AMENDED) A composite ceramic of the $\text{Si}_3\text{N}_4/\text{SiC}$ type prepared from a $\text{Si/C/N/E}_a/\text{F}_b/\text{G}_c/\text{O}$ multielement nanopowder where E, F, and G represent three distinct metallic elements, other than Si, and where at least one of a, b, and c is non-zero, that is suitable for being obtained by the fabrication method of claim 7, ~~and characterized by the fact~~ such that the grains constituting it are of a size smaller than 100 nanometers.

15. (CURRENTLY AMENDED) A composite ceramic according to claim 14, ~~characterized in that it presents~~ having a density that is equal to at least 99.5% of its theoretical density.

16. (NEW) A nanopowder according to claim 10, characterized in that the index c of G_c is zero, such that the nanopowder contains only the two metallic elements E and F.

17. (NEW) The use of a $\text{Si/C/N/E}_a/\text{F}_b/\text{G}_c/\text{O}$ multielement nanopowder according to claim 12 for fabricating a composite ceramic.